

temperature) to Tc1 and therefore, does **not** teach or suggest reheating the laminate up to a **temperature exceeding Tc1** (as required by present claim 1) to **positively crystallize the PGA**.

In item 4 on page 3 of the Office Action, the Examiner alleges that a person skilled in the art would have been motivated to crystallize the PGA to full opacity for the purpose of ensuring crystallization of the PGA layer in order to impart gas barrier properties to the PGA layer.

However, as discussed above, Kawakami contains no disclosure suggesting positively crystallizing and opacifying the PGA prior to stretching.

Further, in response to item 6 on page 3 of the Office Action, Applicants assert that a person skilled in the art would not have been able to conceive that an increased haze of at least 40% before stretching is an optimum value since Kawakami fails to teach or suggest any value in positively crystallizing and opacifying the PGA. Further, as discussed below, Kawakami teaches that crystallizing PGA above Tc1 makes stretching difficult, if not impossible.

In response to items 7 and 18 on pages 4 and 6 of the Office Action, Applicants assert again that Kawakami does not disclose a temperature range before stretching that overlaps the claimed range (in excess of Tc1) for the reasons discussed above and of record. Specifically, as argued in the Amendment of June 30, 2010, Kawakami discloses **stretching the extrudate in a temperature range of from Tg (glass transition temperature) to Tc1 (crystallization temperature) of the PGA material**. See col. 4, lines 15-25 of Kawakami. Further, Kawakami discloses that the reason for this temperature range is that when, in contrast, an amorphous sheet of PGA “is crystallized at a temperature exceeding its crystallization temperature Tc₁ (about 80°C)... the biaxial stretching of the amorphous sheet... is extremely difficult or actually impossible under such stretching conditions...” See column 2, lines 57-64 of Kawakami.

Applicants submit herewith a Rule 132 Declaration in support of the position that Kawakami fails to teach or suggest reheating the laminate to a temperature exceeding Tc1 to crystallize the PGA before stretching as required by the claimed method. Further, the Rule 132 Declaration shows that the present inventors discovered that the presently claimed method achieved unexpected results that are not recognized by the Kawakami reference.

Thus, the following table (from the Declaration) is data gathered by the Applicants of the temperature-dependent half-crystallization time of PGA from an amorphous (quenched) state

(i.e., half of the time until a polarized light transmittance is saturated, meaning substantially full crystallization at a specified temperature).

Temperature (°C)	Half crystallization time (sec.)
70	250
80	108.6
100	19.98
120	9.73
140	6.56
160	4.6
180	3.7

As disclosed in the table above, the half-crystallization time of PGA at 70°C is 250 sec. Further, a substantial degree of crystallization **cannot** occur at the preferred stretching temperatures of 30-58°C (column 14, line 21) or 42-44°C (Examples 5 and 6) of Kawakami even if an unrealistically long time is taken before the stretching.

Thus, it is clear from the Declaration that the general practice in the art before the present invention, including the teachings of Kawakami, was to perform the stretching of a crystalline polymer including PGA **before** a substantial degree of crystallization occurred in the polymer since crystallization was known to result in a harmful opaque state and difficulty in stretching the polymer.

In contrast, in the Examples of the present invention, a laminate including a layer of PGA (Tc1=90°C, as described at page 14, line 8) was heated up to 97°C (Example 1) or 105°C (Example 2) in 20 sec., thus exceeding Tc1 and then held at that temperature for an additional 20 sec. to positively crystallize the PGA layer to provide an opacity of well above 40%. This is based on an unexpected discovery by the present inventors that even if a PGA layer in a laminate is substantially crystallized to be opaque by heat treatment before stretching, co-stretching of the laminate with another thermoplastic resin can be smoothly performed while achieving clarification of the PGA layer, which does not obstruct the formation of a transparent film, and

contributes to an improvement in gas-barrier properties, as discussed on pages 3 and 4 of the specification.

The above discussed unexpected results are not recognized by Kawakami.

Regarding the secondary references cited by the Examiner, Shiiki merely teaches the inclusion of a PGA layer in a laminate, and thus fails to remedy the deficiencies of Kawakami. The non-patent literature entitled "Polymer.htm" teaches that increased crystallization is associated with increased rigidity (page 4, lines 15-17), i.e., decreased stretchability, and thus also fails to remedy the deficiencies of Kawakami, and in fact supports the patentability of the present invention.

Thus, the references cited by the Examiner fail to teach or suggest reheating a laminate to a temperature exceeding Tc1 to positively crystallize the PGA layer to be opaque as required by the present invention. Accordingly, this rejection should be withdrawn.

Therefore, in view of the foregoing remarks, it is submitted that the ground of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

If, after reviewing this response, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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/Chao Gao/

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